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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,965	03/31/2004	Young-chol Lee	101-1024	4873

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EXAMINER	
CRUZ, MAGDA	

ART UNIT	PAPER NUMBER
2851	

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H'A

Office Action Summary	Application No.	Applicant(s)	
	10/812,965	LEE ET AL.	
	Examiner	Art Unit	
	Magda Cruz	2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/31/04 & 1/24/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-9 and 12-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee et al.

The applied reference has a common inventor and assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Lee et al. (US Pub. No. 2005/0018147 A1) discloses:

- Regarding claim 1, projection display (Figure 15) comprising an optical modulator (Figure 15, element 410) to modulate a light beam radiating from an illumination unit (Figure 15, element 403) according to image data and projection optics to magnify and project the light beam emitted from the optical modulator (page 2, paragraph 0020, lines 5-6), the illumination unit (Figure 15, element 403) comprising three integrator modules that radiate red, green, and blue beams, respectively (page 5, paragraph 0060, lines 8), with a uniform intensity of light (page 5, paragraph 0063, lines 1-5), wherein each of the three integrator modules comprises, at least one compact light source (page 5, paragraph 0064, lines 1-2), and a glass rod (Figure 15, element 401; page 5, paragraph 0063, lines 8-9) that transforms a light beam emitted from the at least one compact light source so as to have a uniform light intensity and emits the transformed light beam (page 5, paragraph 0063), and that comprises an incident portion through which the light beam radiates (page 2, paragraph 0018, lines 8-10) and an emission portion through which the light beam is emitted (page 2, paragraph 0017, lines 2-4), and wherein the incident portion comprises a parabolic first reflective surface (Figure 6, element 130) to collimate the light beam radiating from the at least one compact light source (i.e. LED, Figure 6, element 200), and the at least one compact light source is

located in the vicinity of a focal point of the first reflective surface (page 3, paragraph 0042, lines 1-3).

- Regarding claim 2, at least one of the three integrator modules (elements 410; page 5, paragraph 0065, line 6) comprises an aperture with an aspect ratio equal to an aspect ratio of an aperture of the optical modulator (page 5, paragraph 0065, lines 4-6).
- Regarding claim 3, at least one of the three integrators comprises an aperture with a predetermined size equal to a size of the aperture of the optical modulator (page 5, paragraph 0065, lines 4-6).
- Regarding claims 4 and 16, at least one compact light source (i.e. LED, Figure 6, element 200) is arrayed so that an optical axis (Figure 6, element 202) of the at least one compact light source (i.e. LED, Figure 6, element 200) is perpendicular to a principal axis (Figure 6, element 140) of the first reflective surface (page 3, paragraph 0042, element 3-5).
- Regarding claims 5 and 17, a second reflective surface faces the first reflective surface and comprises an optical window through which the light beam radiates from the at least one compact light source (page 2, paragraph 0018, lines 7-10).
- Regarding claims 6 and 18, the second reflective surface (Figure 8, element 150) inclines with respect to the principal axis (Figure 8, element 140) of the first reflective surface (Figure 8, element 130) at a predetermined incidence angle (page 4, paragraph 0047, line 5), and the

at least one compact light source (Figure 8, element 200) is arrayed so that an optical axis (Figure 8, element 202) of the at least one compact light source (Figure 8, element 200) inclines with respect to the principal axis (Figure 8, element 140) at the same angle as the predetermined incidence angle as the second reflective surface (Figure 8, element 150).

- Regarding claim 7, the optical modulator is a reflective optical modulator (i.e. DMD, Figure 16, element 430), and the illumination unit (Figure 16, element 400) further comprises relay optics (Figure 16, elements 402) which guides the light beam emitted from the at least one of the three integrator modules toward the reflective optical modulator (page 5, paragraph 0063, lines 5-8).
- Regarding claim 8, at least one of the three integrator modules comprises an aperture with an aspect ratio equal to an aspect ratio of an aperture of the optical modulator (page 5, paragraph 0065, lines 4-6), and the relay optics magnifies or reduces the light beam emitted from the at least one of the three the integrator modules so that the light beam is incident on the reflective optical modulator (page 2, paragraph 0020, lines 5-6).
- Regarding claim 9, at least one of the integrator modules comprises an aperture equal to an aperture of the reflective optical modulator (page 7, claim 22), and the relay optics (Figure 16, element 402) adjusts the light beam emitted from of the at least one of the integrator modules (Figure 16, element 401) with respect to the aperture of the reflective optical

modulator at a magnifying power of 1:1 (i.e. reflects the light beam reflected from element 400 toward the DMD 430, toward the projection optics 440 to produce an image that is magnified; page 5, paragraph 0062, lines 1-6).

- Regarding claim 12, a projection display comprising one or more integrator modules (Figure 16, element 401) that emit a light beam with a uniform intensity of light (page 5, paragraph 0063, lines 1-5), a digital micromirror device (Figure 16, element 430) that modulates the light beam according to image data (page 5, paragraph 0062, lines 6-8); projection optics (Figure 16, element 440) that magnifies and projects the light beam emitted from the digital micromirror device (Figure 16, element 430), and a total internal reflection prism (Figure 16, element 441) that guides the light beam emitted from the one or more integrator modules toward the digital micromirror device and the light beam emitted from the digital micromirror device toward the projection optics (page 5, paragraph 0062, lines 10-14), wherein the one or more integrator modules comprise, at least one compact light source (page 5, paragraph 0063, lines 1-4), and a glass rod (element 401) that transforms a light beam emitted from the at least one compact light source to have a uniform light intensity and emits the modulated light beam (page 5, paragraph 0063, element 1-5), and comprises an incident portion through which the light beam radiates (page 2, paragraph 0018, lines 8-10) and an emission portion through which the

light beam is emitted (page 2, paragraph 0017, lines 2-4), and wherein the incident portion comprises a parabolic first reflective surface (Figure 6, element 130) to collimate the light beam radiating from the at least one compact light source (i.e. LED, Figure 6, element 200), and the at least one compact light source is located in the vicinity of a focal point of the first reflective surface (page 3, paragraph 0042, lines 1-3).

- Regarding claim 13, three integrator modules that emit red, green, and blue beams, respectively (page 5, paragraph 0060, lines 7-8), and the projection display further comprises an optical path changer that guides the red, green, and blue beams emitted from the three integrator modules toward the total internal reflection prism (i.e. it can be changed into an angle at which a light beam is to be efficiently incident on an object, therefore, results in improving light efficiency; page 4 paragraph 0057, lines 2-5).
- Regarding claims 14 and 15, the one or more integrator modules comprise an aspect ratio equal to an aspect ratio of an aperture of the digital micromirror device (page 5, paragraph 0065, lines 4-6).
- Regarding claim 19, a glass rod having an incident portion to transform a light beam emitted from the light source (page 5, paragraph 0063, lines 8-10), and an emission portion to emit the transformed light beam substantially in a principal axis of the glass rod (page 3, paragraph 0043, lines 7-10), wherein the incident portion comprises a first reflective surface

(Figure 6, element 130) and a second reflective surface (Figure 6, element 150) to reflect a first portion of the light beam emitted from the light source (Figure 6, element 200) and to reflect a second portion of the light beam reflected by the first reflective surface, respectively (page 3, paragraph 0040, lines 1-4), and the light source (Figure 6, element 200) is disposed at a focal point of the first reflective surface (page 3, paragraph 0042, lines 1-3).

- Regarding claim 20, the first reflective surface is a parabolic surface (page 2, paragraph 0018, line 4), and the second reflective surface is a flat surface (see the shape of element 150, Figure 6) having a portion disposed on the focal point of the first reflective surface (page 3, paragraph 0044, lines 6-10).
- Regarding claim 21, a rod portion (Figure 6, element 101) disposed between the incident portion and the emission portion in a direction parallel to the principal axis (page 3, paragraph 0043, lines 6-10) to transmit the first portion of the light beam reflected by the first reflective surface (Figure 6, element 130) and the second portion of the light beam reflected by the second reflective surface (Figure 6, element 150) to the emission portion substantially in a direction parallel to the principal axis (Figure 6, element 140).
- Regarding claim 22, an integrator module (Figure 16, element 401) comprising a glass rod (page 5, paragraph 0063, element 8-9) having an

incident portion to transform a light beam emitted from the light source (Figure 16, element 403), and an emission portion (i.e. right side of element 401) to emit the transformed light beam substantially in a principal axis of the glass rod; an optical modulator (Figure 16, element 430) to modulate the light beam emitting the emission portion of the glass rod according to image data (page 5, paragraph 0063, lines 4-5), and projection optics (Figure 16, element 440) to magnify and project the light beam emitted from the optical modulator (Figure 16, element 430). The incident portion comprises a first reflective surface (Figure 6, element 130) and a second reflective surface (Figure 6, element 150) to reflect a first portion of the light beam emitting from the light source (Figure 6, element 200) and to reflect a second portion of the light beam reflected by the first reflective surface, respectively (page 3, paragraph 0040, lines 1-4), and the light source (Figure 6, element 200) is disposed at a focal point of the first reflective surface (page 3, paragraph 0042, lines 1-3).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. in view of Koo et al.

Lee et al. (US Pub. No. 2005/0018147 A1) teaches the salient features of the present invention as explained above (see Rejection under §102(e)), except an illumination unit comprising a λ/4 plate and a polarizing beam splitter which transmits one of P and S waves and reflects other one of the P and S waves.

Koo et al. (US Patent Number 5,772,299) discloses a λ/4 plate (Figure 17A, element 503) and a polarizing beam splitter (Figure 17A, element 501) which transmits one of P and S waves and reflects other one of the P and S waves (column 13, lines 43-49 and 56-59).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to utilize the λ/4 plate and a polarizing beam splitter disclosed by Koo et al. in substitution of the synthesizing prism from Lee et al.'s invention, for the purpose of effectively focusing light and preventing any decreasing in wave length plate and contrast characteristics by increasing light usage efficiency (column 1, lines 9-12).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Magda Cruz whose telephone number is (571) 272-2114. The examiner can normally be reached on Monday through Thursday 8:00-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571) 272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Magda Cruz
Patent Examiner
Art Unit 2851

August 22, 2005